Comments and Responses to Public Notice on the Nationwide TSCA PCB Disposal Approval for Disposal of PCBs in M55 Chemical Agent Rockets in the Deactivation Furnaces of the Army Chemical Agent Disposal Facilities

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Responses to Comments on Public Notice for the TSCA Draft Approval for the Army DFS.

The following are responses to comments received from public notice regarding the nationwide TSCA Draft Approval for the U.S. Army Deactivation Furnace System (DFS) based on operation performed at the Deseret Chemical Depot Army Chemical Agent Incinerators. The public notice were published in Salt Lake City Tribune and the Tooele periodicals. Public comment period began February 25, 2000 and closed April 28, 2000. Comments were reproduced, as much as practicable, verbatim.

Commentor 1

Sandra Steingraber in her book Living Downstream writes: "No mater how improved or what they are called, incinerators only transform garbage; they don't provide a final resting place for it. There remains the question of where to put the ashes. Second, these cavernous furnaces create, out of the ordinary garbage they are stoked with, new species of toxic chemicals.... The indestructability (sic) of matter remains supreme." (pp. 215-216)

My question is: What will be issuing from the incinerator of M55 chemical agent rockets containing PCBs, using the deactivation furnaces system (DFS) in TOCDF?

EPA Response: Steingraber's term "garbage" may refer to household trash or commercial and light industrial garbage and her "incinerators" to municipal incinerators. Municipal incinerators have a reputation for emitting "products of incomplete combustion," more commonly referred to as "PICs." However, designs for municipal incinerators are improving, which should reduce the emission of PICs. One function of the municipal incinerators is to reduce the volume of garbage which would otherwise be placed in municipal landfills. Because the availability of sites for construction of landfills is diminishing more and more with every passing year, municipal incinerators play a significant role in the handling of "garbage."

The Army Deactivation Furnace System (DFS) incinerates no "ordinary garbage." Among other chemical weapons, the DFS disposes of M55 chemical agent rockets. M55 chemical agent rockets contain toxic chemical and nerve agents, high explosives and energetic rocket propellants. Many of the firing/shipping tubes of the rockets contain significant concentration of PCBs. The DFS incinerates the rockets and emits acceptably clean gases. The stack emission data indicate that PCB emissions averaged less than 10 nanograms per second while the health risk assessment for the facility assigned the emission rate of 540 nanograms/sec as the value where risk begins. Ash from the DFS is disposed of in state-permitted hazardous waste landfills and the scrubber water is treated and/or contained in double-packed drums and placed in hazardous waste landfills. So waste streams are properly disposed of. Detailed data for stack emissions and process streams from the DFS are presented in the trial burn report available at the Marriott Library, University of Utah, Salt Lake City and the Tooele City Library, 47 East Vine Street, Tooele, Utah. The data is also summarized in Appendices II and III of the Draft TSCA Approval for the DFS, also available at the libraries.

Importantly, in a letter from the Centers for Disease Control and Prevention (CDC) to the Utah Citizens Advisory Commission (CAC), the CDC summarizes " Finally, in our examination of Tooele stack emissions, we review the relative magnitude of mass emissions of potentially harmful compounds in comparison with other area sources of such materials to see if they would be expected to result in a noticeable increase in area air pollution levels. Although available data are somewhat limited, we found Tooele facility to be a relatively minor contributor of pollutants to the air basin for Tooele and Salt Lake Counties. In summary, we believe that the Tooele stack emissions are safe and will not adversely affect the health of people in

communities located near the facility." (Letter available at the following website: http://www.cdc.gov/nceh/demil/articles/Utahletter.htm)

Commentor 2

Sir, PAYSON, Utah sewer plant is a dis[grace], unsafe, dumps in landfills waste of human's unsanitary no c[h]lorine terrible working conditions Hazardous, I know I work at this facility I dump in landfills Human wastes. Help

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EPA Response: The concern is a State/local responsibility and should be addressed by the State or county.

Commentor 3

I am one of the attorneys representing the Chemical Weapons Working Group (CWWG), Sierra Club, and various other organizations and individuals who oppose the incineration of chemical warfare agent munitions. I recently received a copy of an EPA flyer that advertised a meeting in Tooele, Utah concerning the Army's plan to dispose of PCB contaminated rocket shipping tubes via incineration. The meeting is scheduled for April 11, 2000.

The flyer indicates that EPA is proposing nationwide approval of the Army's plan. Based on this statement, I would appreciate it if you could promptly answer several questions:

Will other impacted communities have a public hearing on this issue? If the answer is no, please explain EPA's basis for excluding other communities from the public hearing process. If the answer is yes, can you advise when and where other hearings will be held.

EPA Response: EPA is firmly committed to giving interested members of the public a voice in decision-making processes that may affect the environment. For this reason, EPA has held public meetings in Utah and Alabama for residents concerned about the proposed approval, even though the Agency's regulations for PCB incinerator approval do not require formal notice and comment on each approval issued. EPA also intends to invite further public participation from each of the other communities (Pine Bluff, Umatilla) involved in the Army's destruction of chemical agent rockets containing PCBs. The issue of public participation at other impacted communities will be reviewed by Regional Administrators. What form of public participation and the scheduling of the event will be determined by the Regional Offices. Should public meetings or hearings be appropriate, the time and location will be determined by the Regional Offices.

Commentor 3:

What data and information is EPA relying upon in proposing nationwide approval? Please be specific in your response.

EPA Response: The nationwide approval was based on data from the latest trial burn completed at the Tooele Chemical Disposal Facility (TOCDF), Deseret Chemical Depot, Tooele, Utah. Documents pertaining to

TOCDF project include the TSCA PCB Disposal approval application, trial burn demonstration plan and trial burn report. These document as well as the draft nationwide approval are on display for public review at the Marriott Library, University of Utah, Salt Lake City and the Tooele City Library, 47 East Vine Street, Tooele, Utah.

Commentor 3: What official(s) within EPA have the authority to reject the proposal for nationwide approval?

EPA Response: The approving authority for the nationwide PCB Disposal approval has been delegated to the Director, National Programs Chemical Division (NPCD) of the Office of Pollution Prevention and Toxics (OPPT) at EPA.

Commentor 3: What EPA or EPA contractor staff have examined the data and information identified in response to question 2?

EPA Response: The approval writer, Hiroshi Dodohara, in the Fibers and Organics Branch in NPCD and EPA contractor Mid West Research Institute.

Commentor 4:

A. A permit is being proposed to burn PCBs in chemical weapons incinerators around the country. However, a public hearing is only being held at 1 site--Utah. The citizens of Alabama, as well as the other affected states, deserve to have a public meeting in our own state, in the local community that is being affected--before the end of the public comment period. Saying that you will hold a public meeting prior to burning, yet after the permit has been issued, indicates a predetermined response.

EPA Response: EPA is firmly committed to giving interested members of the public a voice in decision-making processes that may affect the environment. For this reason, EPA has held public meetings in Utah and Alabama for residents concerned about the proposed approval, even though the Agency's regulations for PCB incinerator approval do not require formal notice and comment on each approval issued. EPA also intends to invite further public participation from each of the other communities (Pine Bluff, Umatilla) involved in the Army's destruction of chemical agent rockets containing PCBs. The issue of public participation at other impacted communities will be reviewed by Regional Administrators. What form of public participation and the scheduling of the event will be determined by the Regional Offices. Should public meetings or hearings be appropriate, the time and location will be determined by the Regional Offices.

Commentor 4:

B. Anniston, Alabama, is already the PCB contaminated capital in this country. PCBs were manufactured by Monsanto here for nearly 50 years before being discontinued in 1971. However, many residents who have been tested have very high levels of PCB concentration in their body. High levels have even been found in 5 year old children, which means the contamination is continuing to affect people. Our population cannot afford to have ANY further contamination! We are already overburdened!

EPA Response: EPA is aware of the high levels of PCB and lead in soil in the vicinity of Anniston industrial

areas. EPA agrees that the citizens of Anniston cannot afford to have further contamination in the area. To preclude further burden of contamination, the chemical agents stored at the Army depot must be disposed of before any catastrophe occurs which may release chemical agents. Currently, the most effective method of destroying the chemical agents in weapons is by incineration. Alternative methods are being developed but have not been fully tested.

Commentor 4:

C. There are advanced non-incineration technologies that are available for the disposal of materials in chemical weapons that contain PCBs and other toxic materials. We want them disposed, BUT SAFELY. We do not want to sacrifice our health in the process!

EPA Response:

Army Alternative Technology

First, the issue of the availability of alternative or non-incineration technologies will be addressed. Currently, the Army Dialogue on Assembled Chemical Weapons Assessment (ACWA) is evaluating seven companies and their processes for disposing chemical weapons. Caustic neutralization, the chemical process selected for destroying bulk chemical and nerve agent has been a proven method for decades. This technology is not new. The only set back for this technology has been cost and the concern that this technology may not equal the destruction effectiveness of incineration. Moreover, caustic neutralization has not been effective in destroying PCBs. EPA has extensive experience in alternative technology for PCB disposal, evaluating many alternative technologies for the destruction of PCBs. The technologies currently being evaluated by the Army have not been demonstrated to destroy PCBs.

The Army's selection of seven processes has not addressed the destruction of PCBs. The seven processes are listed below, with comment.

1. The following three processes have been demonstrated in pilot scale; however, they require scale up demonstrations.

Burns & Roe (Plasma Arc)

Several companies have applied for approval but only one company, Westinghouse, has demonstrated the plasma arc technology to destroy PCBs. The demonstration was not completed due to operational difficulties.

General Atomics (Cryofracture-Hydrolysis-SCWO)

Cryofracture may be effective for weapons such as projectiles and mines but has not been demonstrated for rockets. The rocket tubes, which contain the PCBs, must be treated. General Atomic has not demonstrated the capability for treating the rocket tubes. The supercritical water oxidation holds potential for destroying PCBs, but has not been demonstrated.

Parsons/Honeywell (HP Water Jet-Neutralization)

The Parsons/Honeywell process uses the caustic neutralization followed by biotreatment. The process is effective for GB but ineffective for VS. Destruction of PCBs has not been demonstrated.

2. The four processes below have not been demonstrated, but are scheduled to be demonstrated:

AEA Technologies/CH_2MHill (HP Wash-Silver II)

Silver II reaction has not been demonstrated for destruction of PCBs.

ArcTech (Hydrolysis/Peroxide/Fenton's Reagent)

Several years ago, a company expressed interest in applying Fenton's Reagent in destroying PCBs. The company representative has not been heard from since.

Lockheed Martin (Caustic Hydrolysis)

Comments on the application of caustic reactions to PCB destruction have already been expressed.

Teledyne/Commodore (Solvated Electron)

Commodore has demonstrated the solvated electron in treatment of PCBs in soil. EPA has approved a 250 pound/batch bench scale unit for soil remediation. Commodore's has scheduled a demonstration with a one-ton per batch unit. This upcoming demonstration is their second test after an initial shortfall.

EPA Alternative PCB Disposal Technology:

The following is a brief list of alternative technologies which EPA believes are viable technologies, potentially practicable for permitting. These technologies may be applicable to the PCBs in the M55 Rocket Firing Tubes; however, these technologies do not address the entire rocket. The destruction of the nerve agent, the explosives and the rocket propellant in the M55 units likely require technologies not evaluated by EPA. In addition, the rocket tubes may require size reduction (pulverization) prior to treatment using the technologies listed below.

THERMAL PROCESSES

Thermal Desorption

Maxymillian Technologies, Inc. (ex-situ process) has been approved by EPA.
Shell's Terra Therm (in-situ process) demonstrated but was not approved.

Vitrification

Geosafe Corp. (in-situ process) has been approved.
DOE-Paducah (ex-situ process) expressed interest in EPA approval.

Plasma Arc

Westinghouse, Inc. demonstrated but was not approved.

Molten Metal

Molten Metal Technologies, Inc. completed R&D tests for liquid PCBs.

NON-THERMAL PROCESSES

Chemical Dechlorination

Sunohio, Inc.- approved by EPA, the only company remaining in operation.
S.D. Myers - approved but no longer operating.
PPM, Inc. (Laidlaw) - approved but in the process of closure of facilities.
Acurex, Inc. - approved but no longer operating.
AMOP, Inc. - approved but no longer operating.
Chem Decon, Inc. - approved but no longer operating.
BCD Process (Batelle) - base-catalyzed decomposition (BCD) is scheduled for demonstration.
Safety Kleen, Corp. - hydrogen reduction process for treating used oil has

approval.

Commodore, Inc. - solvated electron technology for 250-lb. Batch process has been approved for (FOR WHAT?)

Solvent Extraction

Terra-Kleen, Corp. (soil washing) - soil washed with proprietary solvent approved.

B.E.S.T. Process (soil washing) - soil washing with proprietary solvent, completed R&D tests.

Commentor 4:

D. Please hold public meetings at all sites before deciding on whether to issue a permit to burn PCBs.

EPA Response: EPA is firmly committed to giving interested members of the public a voice in decision-making processes that may affect the environment. For this reason, EPA has held public meetings in Utah and Alabama for residents concerned about the proposed approval, even though the Agency's regulations for PCB incinerator approval do not require formal notice and comment on each approval issued. EPA also intends to invite further public participation from each of the other communities (Pine Bluff, Umatilla) involved in the Army's destruction of chemical agent rockets containing PCBs. The issue of public participation at other impacted communities will be reviewed by Regional Administrators. What form of public participation and the scheduling of the event will be determined by the Regional Offices. Should public meetings or hearings be appropriate, the time and location will be determined by the Regional Offices.

Commentor 5:

I am on the Utah Citizens Advisory Commission for TOCDF and need more information on the public meeting scheduled for 11 April 2000 in Tooele. Can you tell me if the PCBs that are to be disposed at TOCDF are just those found in the fiberglass rocket tubes or are other wastes containing PCBs being considered? What amounts and concentrations of PCBs are proposed for destruction in the deactivation furnace?

EPA Response: The Army demonstrated the disposal of M55 rockets only in the deactivation furnace. Therefore, the approval will allow the Army to destroy PCBs in the rockets only. The rocket shipping/firing tubes contain PCBs. PCB concentration varies in the tubes according to type, i.e., matted and chopped fiberglass. The matted tubes contain no regulated PCBs (< 50 ppm). The chopped tubes exhibited low levels of PCBs. Each tube weighs about 13.7 pounds. The remaining number of rockets at the Deseret Chemical Depot totals 7,978 (as of 4/10/00). Of these, 75% contain PCBs below the regulatory level of 50 ppm. The remaining tubes average 1,247 ppm PCBs. A conservative calculation follows, assuming the 75% contains 50 ppm PCBs.

Quantity of PCBs = [7,978 X 0.75 X 13.7 X 0.000050] + [7,978 X 0.25 X 13.7 X 0.001247]
= 4.1 + 34.1
= 38.1 pounds

The quantity of PCBs to be burned in the DFS is 38.1 pounds.

Commentor 6:

Alternative non-incineration methods for destruction methods of chlorinated chemicals have been commercially available for a decade. All of these commercial programs can be mobile, and can travel to the site sparing the hazard and cost of transporting the chemicals.

Last month, EPA announced its intention to approve a "national" TSCA permit to burn PCBs containing shipping tubes for M55 rockets containing nerve agent in chemical weapon incinerators in Utah, as well as in Oregon, Alabama and Arkansas.

Alternative Commercial Methods Cheaper and Safer

In 1991, the Office of Technology Assessment of the Congress found that the base-catalyzed process (the official program of the US Navy) and the thermal gas process were less expensive than the standard incinerator approach for soil incineration.

I've enclosed the relevant part of that report, "Dechlorination Technologies". The US Army PCB's containing rocket tubes could be successfully treated with these methods.

The OTA report points out that the US Navy has adopted the base catalyzed technique as their official approach. Why is the Army so slow? Why does EPA bless more expensive and less effective technologies with a TSCA national permit? Can't we do better?

EPA Response: In discussing alternative technologies to destroy PCBs, EPA has evaluated many alternative technologies for the destruction of PCBs. These technologies include alkali metals such as sodium, as well as the EcoLogic Process. EPA did not issue an approval to EcoLogic. We participated in the initial phase of the Navy-Guam base-catalyzed dechlorination (BCD) project in evaluating the process. The BCD technology at that time used thermal energy for removal of 70% of the PCBs and the remainder using the chemical reaction of the BCD reagent. The Army DFS uses thermal energy to remove and to destroy the PCBs in the M55 rocket shipping tubes. While the DFS has no problems meeting the TSCA standard for PCBs destruction and removal of PCBs, the BCD technology was not demonstrated to EPA; thus EPA was denied the opportunity to determine whether the PCB technology meets the TSCA PCB incineration equivalency standard. To date and to our knowledge, the Guam unit has not been commercialized in the US. The equipment used in the project is currently located in Guam. However, EPA will have a second opportunity to evaluate the BCD concept in the near future. The process will be used to remediate the Warren County Landfill site in North Carolina.

Commentor 6:

Traditional Burning Programs Produce Dioxins: We continue to be astonished to see the continued push of federal agencies, including your own agency, to try to burn chlorinated chemicals. It is amply demonstrated that chlorine combines with other organic material in the burning process to produce toxic dioxins, furans, HCB and other chlorinated compounds.

EPA Response: The premise that incineration produces dioxin and other toxic chlorinated organic compounds is only factual when an incinerator operates under ineffective conditions. EPA develops approval operating conditions during trial burn tests. When operated under approval conditions, emissions from the incinerator meet standards imposed by various agencies including local, state and federal agencies. Health risk assessments, which must reflect local and site-specific conditions, define emissions which are safe and risk-minimized. The Army Deactivation Furnace System was tested under trial burn conditions. Emission and process stream data indicate that all standard and health criteria were met. Therefore, EPA believes that an approval for the DFS to dispose of PCBs will not create an unreasonable risk of injury to public health or the

environment.

Commentor 6: Alternative Programs Complex Chlorine With Sodium or Hydrogen: In the alternative methods, chlorine is dislodged from the PCB's with hydrogen donation, and then combines with sodium to produce salt or in the EcoLogic method, combines with hydrogen to produce hydrogen chloride.

We hope that you can persuade the US Army to reconsider its program of burning chlorinated chemicals, and go the US Navy route with proven alternative - and less expensive dechlorination methods.

EPA Response: To date, incineration of PCBs has been the standard to which all PCB destruction and treatment technology must comply. To obtain approval, all alternative technologies since the conception of the EPA PCB program have had to demonstrate that the technology is equivalent to incineration. The technologies selected by the Army in their ACWA program have not been approved by EPA to treat PCBs for disposal, with the exception of the solvated electron process which has had limited success.

The Navy selected the BCD process to treat PCB contaminated soil. We were asked to evaluate the BCD technology to obtain a TSCA PCB Disposal Approval. We completed the review of the application and demonstration plan and transmitted our comments to the applicant. However, we were not asked to participate in the demonstration. Thus, a TSCA approval for the BCD technology was not issued. To our knowledge, the Guam unit has not been used in any other PCB contaminated site.

Commentors 7

These comments voice strong opposition to the U.S. Environmental Protection Agency's (EPA) intent to issue a national permit/approval authorizing the U.S. Army to burn materials from the nation's chemical warfare agent stockpile that contain polychlorinated biphenyls (PCBs).

Commentor 7 A): EPA Violated The National Environmental Policy Act ("NEPA") By Not Preparing An Environmental Impact Statement ("EIS") Evaluating Issuance Of The PCB Permit.

EPA failed to engage in any analysis pursuant to the National Environmental Policy Act (NEPA) to evaluate issuance of the an approval for the Army to incinerate PCBs pursuant to TSCA. EPA's failure violates NEPA and necessitates postponement of any action by EPA regarding the TSCA permit until EPA has met its obligations under NEPA to evaluate the environmental impacts of and alternatives to the Army's chemical warfare agent incinerators.

NEPA requires all federal agencies to evaluate the environmental impacts of major federal actions significantly affecting the quality of the human environment. See 42 U.S.C. § 4332. This requirement applies to EPA's issuance of a permit under TSCA, and its failure to prepare an EIS violates NEPA. Unlike other environmental statutes, such as the Clean Water Act and Clean Air Act, TSCA contains no statutory exemptions from NEPA's requirements. See 33 U.S.C. 1371 (Clean Water Act); 15 U.S.C.§ 793(c)(1) (Energy Supply and Environmental Coordination Act's exemption for Clean Air Act).

EPA's issuance of the TSCA permit should be postponed until EPA has met its obligations under NEPA by preparing an EIS that evaluates the environmental impacts of and alternatives to the Army's plan to incinerate PCB-contaminated materials. EPA's failure to satisfy NEPA otherwise will subject the Army's operating or proposed incinerators generally to injunctive measures.

EPA Response: NEPA does not require the preparation of separate environmental impact statements by each

Agency involved in a particular project. In 1988, the U.S. Army prepared a Final Programmatic Environmental Impact Statement for its Chemical Stockpile Disposal Program. Subsequently, site-specific EISs were prepared for Chemical Agent Disposal Facilities in Tooele, Anniston, Pine Bluff, and Umatilla. Since an EIS has been prepared for each facility covered by the draft PCB approval, NEPA requirements have been met.

Commentor 7 B: The U.S. Constitution Requires That Citizens Who Will Likely Be Harmed Or Are Being Harmed By The Construction And Operation Of The Army's Incinerators Be Provided A Full Evidentiary Hearing.

Commentor 7 B: EPA Failed to Provide the Affected Public with Adequate Notice and an Opportunity to be Heard Regarding the Plan to Issue TSCA Approval For the Army to Incinerate Polychlorinated Biphenyl Waste.

EPA has failed to meet its obligations under the federal Administrative Procedures Act (APA) and the Toxic Substances Control Act (TSCA) to provide the public with adequate notice of the Agency's plan to provide nationwide PCB approval for the Army's proposed incinerators. The nationwide approval planned by EPA would directly impact persons living in and around four areas of the country: Tooele, Utah; Pine Bluff, Arkansas; Anniston, Alabama, and Umatilla, Oregon. Notices and a public meeting on this issue were provided in Utah, but not elsewhere. For example, the vast majority of the Commentors are not aware of notices placed in local and statewide newspapers, or even the Federal Register, that inform the public about the plan to provide the Army with nationwide approval to incinerate PCBs. The majority of Commentors did not receive direct mailings from the EPA, even though the Army and State agencies have mailing lists of persons who wish to be informed of developments pertaining to the Army's chemical warfare agent incinerators. This is clearly inadequate notice and opportunity to comment.

In addition, EPA has failed to provide adequate access to concerned members of the public throughout the nation to documents that the Agency has reviewed and/or relied upon in its development of the plan to provide the Army with nationwide approval to dispose of PCBs. This problem would have been greatly alleviated by posting documents on EPA's website and advising concerned community members that the documents were available.

The Commentors are very concerned about the Army's incinerators disseminating PCBs throughout the communities where the chemical warfare agents are stockpiled because, as EPA recently noted, exposure to the 209 synthetic organic chemicals collectively known as "PCBs" create "different levels of risk for harmful effects" for people exposed to them and as a result of PCBs "resistance to degradation, PCBs persist in the environment for decades." See "Public Health Implications Of Exposure To Polychlorinated Biphenyls (PCBs)," U.S. Public Health Service, The Agency for Toxic Substances and Disease Registry, U.S. Department of Health and Human Services, and The U.S. Environmental Protection Agency, (Revised February 2, 1999). The Commentors do not want to see their communities and the environment around them used as sacrifice zone for a badly conceived and implemented Army incineration program.

EPA Response: EPA is firmly committed to giving interested members of the public a voice in decision-making processes that may affect the environment. For this reason, EPA has held public meetings in Utah and Alabama for residents concerned about the proposed approval, even though the Agency's regulations for PCB incinerator approval do not require formal notice and comment on each approval issued. EPA also intends to invite further public participation from each of the other communities (Pine Bluff, Umatilla) involved in the Army's destruction of chemical agent rockets containing PCBs. The issue of public participation at other impacted communities will be reviewed by Regional Administrators. What form of public participation and the scheduling of the event will be determined by the Regional Offices. Should

public meetings or hearings be appropriate, the time and location will be determined by the Regional Offices. In addition to the efforts associated with the PCB approval, the Army has offered numerous occasions for public participation in the development of the 1988 Programmatic Environmental Impact Statement as well as the subsequent individual EISs for each site. There have also been extensive public participation opportunities offered as a result of the RCRA permitting process for these sites. EPA believes that the Commentors have had ample opportunity to provide meaningful input on the Army's plans.

Commentor 7B: The U.S. Constitution Requires That Citizens Who Will Likely Be Harmed By The Incineration of PCB-Contaminated Materials Be Provided A Full Evidentiary Hearing

At best, EPA has merely allowed some concerned members of the public to present oral and written comments regarding the EPA's plan to provide nationwide approval for the Army to incinerate PCBs. This process is grossly inadequate and contrary to the rights provided citizens by the U.S. Constitution.

There can be no legitimate dispute that as presently planned the Army's incinerators will release deadly contaminates into our environment including: chemical warfare agent; dioxins and furans; polychlorinated biphenyls (PCBs); mercury; arsenic; lead; and a host of other known and unknown chemicals. Many of these contaminates are persistent, which means they will remain in the environment and our bodies, in some cases, for many years. Once ingested by humans, the contaminates emitted by the Army's incinerators can cause a range of health effects including, cancer, birth defects, immune system effects, reproductive effects, and learning disorders. There is no legitimate dispute that the present cancer rate in North America (before adding emissions from all the Army's proposed incinerators) is an astounding 1 in 3.

It is highly likely that some of these Commentors, their children and other family members, neighbors, and/or friends will ingest some of the PCBs and other dangerous contaminates emitted by the Army's incinerators. As present background exposures to PCBs and dioxins, which cause cancer and non-cancer effects, and other contaminates that may cause cancer are high, the impact of the emissions from the Army's incineration of PCBs will significantly enhance the risk of harm and will likely cause harm. The first victims of such emissions will be infants, children, the elderly, and persons who are already sick or have suffered significant illness.

By approving the Army's request to incinerate PCBs, the EPA is subjecting these Commentors and other impacted citizens to unwanted chemical exposure and ingestion of dangerous chemicals. No government agency, state or federal, has the right to force upon its citizens the ingestion of dangerous chemicals. Certainly, no government agency can cause harm or greatly increase the risk of harm without providing Due Process.[1]

If the Commentors are not provided an evidentiary hearing before an impartial decision-maker with full discovery and the ability to use compulsory process (i.e., force key Army and EPA officials to testify under oath) they will be unable to demonstrate that their position on critical issues like human health risk, environmental risks, and the unproven, experimental nature of the proposed incineration of PCBs is more

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1 In Whitner v. State of South Carolina, 492 S.E.2d 777 (S.C. 1997), the South Carolina Supreme Court upheld the conviction of a woman charged with child abuse. The charge of abuse was based upon the woman's ingestion of cocaine, which in turn exposed her fetus to cocaine. While the Commentors do not pass judgment on the specifics of that case, we see little difference between the criminal offense prosecuted by South Carolina officials and the "permitted" distribution and subsequent ingestion of dangerous PCBs and other chemicals via the Army's incinerators. Does the likely exposure of the fetuses carried by pregnant women and the likely exposure of infants and young children when the dangerous emissions are produced by the Army's incinerators suggest that the Army, its contractors, and other government agency officials may be guilty of child abuse?

credible than the positions taken by the Army. In short, the Commentors must be permitted to test the evidence the EPA and Army rely upon to prove the safety of the plan to incinerate PCBs. If the witnesses and documents offered by the Army and EPA to support permitting the incineration of PCBs cannot withstand the scrutiny of a fairly administered evidentiary hearing, then such approval must not be permitted.

Below, the Commentors provide *prima facie* evidence that the incineration of PCBs at the Army's operating or planned incinerators is not safe and cannot be adjudged worthy of approval under TSCA. Providing the type of hearing described above and mandated by the U.S. Constitution's Due Process requirements will enable the Commentors to fairly prove their well-founded concerns.

EPA Response: Although the U.S. Constitution requires the due process of law before a person may be deprived of life, liberty, or property, the amount of process that is due depends upon the nature of the interests involved. EPA believes that the Commentors have been afforded adequate due process through the public participation opportunities described above.

Commentor 7C: The Army's Chemical Warfare Agent Incinerators Cannot Meet TSCA's Standards for the Disposal of PCB-Contaminated Materials.

Pursuant to TSCA, EPA must take action to prevent "an unreasonable risk of injury to health or the environment." 15 U.S.C. § 2605(e)(2)(B). EPA "may not approve an incinerator for the disposal of PCBs and PCB Items unless [it] finds that the incinerator meets all of the requirements of paragraphs (a) and/or (b) of [40 C.F.R. § 761.70]. Indeed, EPA must go further than merely verifying that the Army's incinerators fulfill the letter of the regulatory standards. Similar to exercise of EPA's RCRA omnibus authority, pursuant to TSCA EPA must protect the public and environment from unreasonable risk.

For the reasons set forth below the Commentors demand that EPA deny the nationwide Approval to Dispose of Polychlorinated Biphenyls (PCBs) ("Draft Approval"). Alternatively, at a minimum, the Commentors insist that EPA address the substantial questions, issues, and concerns raised by all Commentors in a definitive matter, which necessitates withdrawal of the Draft Approval, substantial revision of the Draft Approval, and reissuance of the revised Draft Approval for public comment and hearing.

Commentor 7C: The TOCDF/JACADS Trial Burn Data Relied Upon By EPA Is Grossly Defective and Provides No Basis For Issuing An Approval to Incinerate PCBs

EPA's regulations require that an incinerator achieve a 99.9999 (6-9s) destruction and removal efficiency (DRE) on PCBs. Draft Approval at 9. DRE is calculated by measuring the amount of PCBs placed in the waste stream, and sampling to determine what amount is released into the environment from the stack. Draft Approval at 9.

EPA failed to require and the Army failed to perform a DRE test consistent with agency regulations or standards. The record made available by EPA does not indicate that the PCB testing done at TOCDF included a precise measurement of the amount of PCBs that went into the incinerator during various tests. Consequently, EPA and the Army cannot know what percentage of the PCBs fed to the incinerator were emitted from the stack.

EPA Response: In the early 1980s, the Army characterized the M55 rocket firing/shipping tubes in the stockpile by sampling over 2000 tubes and chemically analyzing them for PCBs. The majority of the rocket tubes were from the stockpile in Deseret Chemical Depot. The remainder of the tubes came from various Army depots storing the M55 rockets. This data was presented for public review at the public repositories

during comment period for the TSCA PCB Draft Approval in the 1993 application submitted by the Army as "Attachment III-1, AEHA Hazardous Waste Study, Phase 3." We believe that this study presents statistically valid results representative of PCB concentrations in the population of M55 rocket stockpile at the time of the study. Data generated for the trial burns testing the DFS at Deseret Chemical Depot reveal that the PCB concentration of the rockets may have decreased from slightly over 2000 ppm to slightly over 1000 ppm. Such a change may have resulted from a change in the characteristics of the rocket population brought on by significant reduction in the number of rockets in the stockpile as a result of studies in the disposal of the rockets throughout the years at the nearby pilot testing facility and during the shakedown and start up phases of the full scale DFS.

In addition, we believe it to be prudent to use the statistically derived PCB concentrations in the firing tubes, 1000+ ppm, for calculating DRE during testing. To collect samples from the firing tube for each rocket to be fed into the DFS is time-consuming and costly. But the critical issue is the safety and health, not only of the workers in the vicinity of the sampling sites, but of the surrounding community. The danger lies in the extensive handling of the M55 rockets necessary to prepare the rockets for sampling. The rockets will require packing into transporting containers, transporting to the work site, unpacking and moving the rocket to the sampling location. Because no remote or robotic sampling mechanism has been developed for sampling the rocket tubes, operators must use manual tools to cut and dislodge a sample. During the sampling procedures, the potential for dangerous consequences are threefold. The potential for chemical agent leaking from the warheads is compounded by potential activation of the explosive warhead as well the ignition of the propellant. These weapons are aging. They have been in storage for decades. There is a history of detection of chemical agents from rockets and other weapons while in storage. Chemical agent releases will not only affect the operators and personnel in the immediate area of the rockets and weapons but also residents and the general public in surrounding areas. EPA believes the benefits derived from sampling and analysis, i.e. a correction of a few ppms of PCBs, cannot be rationalized when compared to risk to health and safety of Army personnel and the general public in the surrounding communities.

Commentor 7C: In addition, several significant errors or weaknesses in the JACADS testing provide no support for EPA's Draft Approval.

- The narrative log for the test burn indicates numerous problems with the system and notes that sampling was delayed during these system failures and shutdowns. As these types of systematic problems are to be an expected part of daily operations and will produce emissions and wastewater and ash, the sampling should have been continued to monitor the efficiency of the system during non-optimal conditions.

EPA Response: The protocol for stack sampling requires sampling to stop during shutdown of the waste feed. To continue sampling when no waste is introduced into the incinerator would have the effect of diluting the stack samples. When waste is not being incinerated, emissions of combustion species in the stack gas diminishes, thus false negative analysis may result. This protocol to stop sampling when feed is shutdown serves to maintain the sample as representative of stack gases as possible.

Commentor 7C:

- The narrative log indicates that the end product ash was sampled after it had cooled. There is no indication that the ash was monitored or tested in any way as the cooling process took place. Because many of the contaminants of concern in this instance are volatile and semi-volatile organic compounds that would tend to elute from heated media, this represents a potential totally unmonitored source of air contamination and unreported system inefficiency.

EPA Response: In demonstrations of standard commercial incinerators, samples of ash are retrieved from the kiln discharge exit to determine if any residual PCBs remain. Prior to exiting the kiln, the ash may be sprayed with water for cooling and for moistening to prevent dusting. The water vapors and gas flows through the pollution abatement system and out the stack. Thus, all the volatile and semi-volatile compounds are drawn up the stack except that small fraction which remains after cooling and sampled and analyzed. Thus all the volatile and semi-volatile compounds are tallied.

In the Deactivation Furnace System, where the primary goal is to destroy the highly toxic chemical and nerve agents, additional procedures are added on top of the normal incineration process to ensure that all the chemical agents are destroyed and removed prior to discharge of ash. After processing of the waste through the kiln, where the standard incineration process ends, the ash is charged to the Heated Discharge Conveyor where the kiln ash is exposed to 1000°F for an additional 15 minutes minimum. This procedure ensures that all of the toxic agents are destroyed and removed prior to discharge and also serves the purpose of removing all the volatile and semi-volatile compounds. Subsequently, the ash discharged into an enclosed bin and held in a holding chamber to cool prior to discharging. After discharging, the ash is analyzed to ensure complete removal of chemical agent and confirmed prior to transport to a holding area where samples are collected for analysis of hazardous components including PCB.

Commentor 7C:

- No sample trains utilized had a recovery rate in the laboratory of more than 83.8 % of the PCB spiked into the system. Therefore, the values reported for PCB emissions and utilized to calculate DRE should have been increased by a minimum of 16.2 % prior to the DRE calculation. The average recovery rate for PCBs in the laboratory for all runs was a very low 68.93 %. Each sample value reported should have been appropriately and proportionally adjusted for recovery rate prior to calculation of the DRE.

EPA Response: Protocols for calculating PCB emission do not include adjustment of emissions values from spike and blank recoveries. To do so may incur false positive and false negative results. To adjust for recoveries would have the affect of increasing emissions values when spike recoveries are low and would decrease emission values when recoveries are high. Similarly with field blanks and trip and method blanks, PCBs are frequently detected and recovered. Applying Commentor's reasoning for requiring adjustment for recovery rates, the detected PCBs in the blanks must be subtracted from the emission values. Subsequently, the result after subtraction would be a lower PCB emission value or at times, a negative PCB emission value. To be consistent, no adjustments are made.

Commentor 7:

- The concentrations of a pre-measured PCB surrogate feed into the incinerator during testing was actually recoverable from the various sampling media. The average recovery rate for Run 1 was 67.74 %, Run 2 at 71.66 %, Run 3 at 70.21% and Run 4 at an astonishingly low 34.1 %. Five samples in Run 4 were spiked with PCB surrogate that was entirely undetected during analysis. Therefore, it is clear that the DRE calculations presented were likely made on the basis of the small fraction of the actual PCB recoverable by use of collection Method 5 and standard analytical laboratory protocol. In any case, the DRE calculations presented must be adjusted proportional to recovery values provided by QA/QC data.

EPA Response: See the previous response. The data which Commentor presents come from Trial Burn 1.

Although a few of the recovery rates in the laboratory procedures are in the low range, the recovery rates fell within the acceptable range. For Trial Burn 1, the laboratory recovery rates are all within the acceptance range and no adjustment is necessary. Moreover, Commentor is reminded that the basis for the TSCA Nationwide Approval is data generated from Trial Burn 2.

Commentor 7C:

In addition, despite prior experience at JACADS, TOCDF still had great difficulty achieving 99.9999 percent DRE during testing. This problem was primarily attributed to some gasket material in the incinerator system that was alleged to contain trace amounts of PCBs. However, during a recent public meeting in Utah on this issue, EPA officials admitted that no PCBs were detected on the actual gaskets used during the testing. Therefore, claims by the EPA and the Army that some gasket material distorted the DRE test results cannot be supported by the record. EPA must reject the TOCDF DRE test results as inadequate and deny the Army's request to incinerate PCBs.

EPA Response: This issue, i.e., gaskets containing PCBs, refers to test results from Trial Burn 1 at TOCDF. Stack emission samples exhibited a high concentration of one specific PCB congener or configuration. Out of 209 possible PCB congeners or configurations, one was predominant. The congener 2,2',4,4'-tetrachlorobiphenyl was the major component of the PCB emissions. This same PCB congener was detected in new gaskets identical to those installed in the incinerator. Analyzing unused gaskets gave assurance that these items were not contaminated during the incineration operations. These gaskets were removed prior the second trial burn. Results from Trial Burn 2 indicated that the offending congener was not present in the stack emissions. EPA therefore concluded that PCBs from the gaskets in fact contributed to the PCB emissions during Trial Burn 1.

Commentor 7C:

Finally, it is very important to note that the test burn conditions relied upon by EPA to issue an approval to the Army to burn PCBs is in no manner representative of operational conditions of the DFS at TOCDF. The Army is presently bypassing the punch and drain steps in the process and feeding rockets directly into the DFS. This process of incinerating essentially the entire rocket, shipping/firing tubes, agent, and the rest, in the DFS has never been subject to test burns. The lack of testing means that little is known about DRE, PICs, and other important issues that serve as indicators of the quality of DFS operations. Consequently, EPA cannot rely on data that was produced during test burns that were not representative of real-life operations.

EPA Response: EPA imposes certain restrictions on the operation of incinerators and other PCB disposal technologies. These restrictions are based on test results from trial burns and formal PCB disposal demonstrations. EPA requires that operations during PCB Disposal demonstrations be based on worst case situations and scenarios. This includes waste feed rate. Thus, during the PCB Trial Burn Demonstrations the worst case for PCBs was demonstrated, i.e., at the feed rate of 33 rockets per hour. When incinerating whole, intact rockets, rockets are processed at a rate of just under 2 rockets per hour. At the 2 rockets per hour rate, the DFS operations comply with feed rate restrictions for chemical agent. This ensures effective destruction of the toxic chemical agent. At this rate, PCBs are fed at one-sixteenth of the maximum rate allowed. The low feed rate ensures effective destruction of PCBs and ensures that PCB emission rates are far less than quantified during the trial burn. All other hazardous components of the rockets are fed at equally lower rates so that the emission rates of these hazardous wastes are equally less than quantified during the trial burn.

Commentor 7C: The Approval To Incinerate PCBs Fails to Provide Firm and Enforceable Standards

EPA must set firm and enforceable standards that are based on what is needed to adequately protect human health and the environment. Once these standards are firmly set, EPA must require that the Army and its contractors accurately and continuously collect and report on data obtained during incinerator operations. The EPA must require the Army and its contractors to utilize on-line gas chromatography or another system or combination of systems that will provide continuous emission information about all stack, vent, and fugitive emissions, including but not limited to: PCBs, dioxins, furans, other dioxin-like chemicals, chlorine, metals, and other hazardous compounds. The emission data collected must also be analyzed using multi-dimensional gas chromatography / mass spectroscopy (MDGC/MS). Such a combination of analytical techniques will provide the best data about the quantities and species of PCBs and other elements or compounds being emitted from the Army's incinerators.

All data and analyses collected and created by the referenced systems should be placed on-line for general review by the public. Information must be placed on-line as it is collected and evaluated by the Army and its contractors. In no case should the information provided by the Army and its contractors be made available any later than it is made available to the EPA or state agencies. The EPA must also require the Army and its contractors to certify the information placed on-line. This will allow the public to determine the status of the incinerator and will prompt citizen-directed enforcement action as needed.

The Draft Approval will not allow citizens to obtain timely or accurate information that will allow them to protect their health and environment. One can hardly expect successful enforcement of requirements that restrict the emission of PCBs without clear and timely data being made available regarding PCB incineration activities. Speculation about how much PCBs (or other substance) may have been emitted during an upset condition creating high level of carbon monoxide (CO) is not an acceptable method for ensuring protection of public health and enforcement. Moreover, speculation about the quantity of PCBs being fed to the incinerator or the amount of PCBs being emitted from the stack does not provide the EPA or citizens with adequate tools for compliance monitoring and enforcement. EPA must require continuous monitoring and publication of such information; otherwise effective compliance monitoring and enforcement will be unattainable. The inability to ensure compliance monitoring and enforcement means that public health and the environment cannot be adequately protected.

EPA Response: Commentor requests implementation of continuous monitoring equipment for measuring compounds such as PCBs, dioxin and other hazardous compounds. Recent advances in continuous monitoring instrumentation include the development of continuous monitoring of heavy metals such as mercury. However, technology for continuous monitoring of organic compounds has only advanced to the point of measuring light hydrocarbons such as methane and other lower aliphatic hydrocarbons. Instruments for detection of known specific compound(s) have been developed where a specific or fixed compound(s) is incinerated at the terminal of a chemical production line. However, these instruments cannot be used where a wide range of unspecified compounds may be emitted. Commentor also requests the use of "multi-dimensional gas chromatography/mass spectroscopy (MDGS/MS) stating that MDGS/MS " and "will provide the best data...." Initially, MDGS/MS is not a continuous monitoring technology, but a laboratory instrument for analysis of samples collected during field operations. Secondly, Commentor's Reference 3 (EPA 1989) clearly cites this technology as a research tool which is time consuming and costly. This technology is currently not readily available.

Method 18, at 40 CFR 69 Appendix A, is an EPA-approved semi-batch or intermittent method for monitoring organic compounds. Method 18 prescribes the use of gas chromatography/mass spectroscopy (GC/MS) using various types of detectors suitable for monitoring a limited assortment of organic compounds. The method limits its use for organic compounds with relatively high vapor pressure. PCBs, dioxins and furans, and other organic chemicals of concern maintain low vapor pressures. In addition, the sensitivity of this

method is limited as observed by the detection limit being in parts per million (in the range of milligrams per liter). PCBs, dioxins and furans are typically examined in concentrations of microgram and nanogram per cubic meter (parts per billion and parts per trillion range). Technology has not advanced to the point where continuous monitoring of complex organic compounds can be implemented.

The organic compounds contained in the stack gas are Products of Incomplete Combustion (PICs). Continuous emission monitoring systems (CEMS) cannot detect pollutants of concern such as PCB and dioxin. However, along with these pollutants of concern, the stack gas contains PICs which CEMS are capable of detecting. Two of these PICs are carbon monoxide (CO) and a collective assortment of compounds termed total hydrocarbons (THCs). Because CO and THCs are PICs, they are indicators of the effectiveness of the combustion process. Because CO and THCs are PICs, they are used as surrogate PICs for such pollutants of concern as PCB and dioxin. By using CEMs to quantify CO and THC, the combustion process can be monitored and the CEM results used to monitor the combustion efficiency. The Clean Air (CAA) and Hazardous Waste (RCRA) programs use carbon monoxide CEMS to monitor combustion processes. PCB regulations under TSCA use carbon monoxide as combustion efficiency to evaluate combustion processes. RCRA regulations require use of CEMS to monitor THC as well as CO to evaluate the combustion process.

Monitoring of CO and THC continuously with CEMS is generally accepted by the agencies as reliable indicators of the effectiveness of combustion processes. Until substantial progress incurs in the development of continuous monitoring systems to accurately quantify pollutants of concern, agencies will continue to implement CO and THC CEMS for evaluating the effectiveness of incinerator systems.

Commentor 7C:

Next, the Draft Approval specifies a destruction removal efficiency (DRE) of 99.9999 percent on PCBs. However, in addition to problems mentioned previously, it is clear from the scientific literature that such destruction efficiencies cannot be achieved on low concentrations of PCBs and other wastes in the waste feed. To date, and despite indications at the Army's JACADS facility in the Pacific and Tooele facility in Utah that the Army's incinerator cannot meet the 6-9s DRE standard, the EPA has failed to address how the Army can be expected to incinerate relatively low concentrations (for DRE purposes) of PCBs in the Army's waste stream. The EPA's findings regarding the TOCDF DFS incinerator indicate a high concentration of PCBs in firing/shipping tubes for rockets of 5,800 ppm and an average concentration of 1,247 ppm. The literature indicates that to achieve a 6-9s DRE using and incinerator requires a feed at concentrations at least 10,000 ppm.

Under EPA contract Midwest Research Institute (MRI) and others have performed extensive field tests on a wide variety of practical incineration devices. The objectives of these tests were to characterize the waste destruction performance of present incineration technology and to determine if any common factors correlate waste destruction among full-scale units. To address the second objective MRI performed an extensive statistical treatment of their data. The most significant statistical correlation found was the relationship between waste penetration (= 1 - DRE/100) and waste concentration in the original feed stream.

One item of significance in the study performed by MRI is that all points above the horizontal dashed line (of Figure 5-1 in the study) represent noncompliance under the 99.99 percent DRE rule. These results indicate that current technology has difficulty meeting the licensing regulations when the waste represents less than 1,000 ppm in the feed stream. This finding has significance with respect to waste streams contaminated by low concentrations of extremely hazardous materials (e.g. dioxin or chlorophenol contaminated pesticides).

It is important to note that Figure 5-1 in the MRI study and the data collected there indicates that a DRE

of 99.9999 percent was achieved only with those chemicals present in the waste at concentrations greater than 10,000 ppm; a DRE of 99.99 percent was achieved only with waste components present at concentrations greater than 100 ppm. Therefore, low concentration of hazardous constituents and PCBs will not be destroyed at a 4-9s or 6-9s DRE. The Army's incinerators will not achieve 6-9s DRE on concentrations of PCBs less than 10,000 ppm.

EPA must establish trial burn and other testing conditions that will ensure the incinerator can handle the types of wastes and concentrations present in the chemical warfare agent stockpile waste stream. This specifically means testing to determine if the incinerator can destroy PCBs at less than 10,000 ppm and other hazardous constituents at less than 100 ppm.

Moreover, DRE as defined by EPA, does not ensure adequate "destruction" of the PCBs contained in the Army's chemical warfare agent waste stream. There are significant quantities of PCBs and dioxins in ash and other process streams. EPA does not evaluate how these wastes will be treated and what impact these wastes will have on human health and the environment.

EPA Response: EPA has extensive experience and data which substantiate that incinerator systems are capable of destroying PCBs to 99.9999% destruction and removal efficiency (six 9s DRE). Since 1986, four companies have received TSCA approvals by demonstrating that their mobile or transportable incinerators systems have the capability to destroy PCBs to six 9s DRE. In addition, seven fixed incinerators, located throughout the country, have been approved to destroy PCBs. Although the MRI study indicated that 10,000 ppm of pollutant in waste feed was the lower threshold for achieving six 9s DRE, EPA evaluated and approved equipment which destroys PCB to six 9s DRE using waste feeds containing PCBs at the 600 ppm level.

When the MRI study was performed, incineration technology had not progressed to the point where certain chemicals classed as hazardous waste were regenerated in the incinerator flue gas. For instance, if Chloroform is used in the feed as a POHC, the resultant DRE may be very low, less than the required 99.99% DRE, because Chloroform is synthesized or regenerated in the incinerator flue gas. However, EPA has not experienced this phenomenon with PCBs. The Army DFS has exhibited the required six 9s DRE at the PCB feed rate levels in the M55 rockets.

Commentor 7D: The Incineration Of the Army's PCB-Contaminated Wastes and Other Wastes Will Result In The Creation And Emission Of Unknown Chemicals That EPA Has Failed To Even Attempt To Assess or Characterize.

As [Rachel] Carson warned in one of her last speeches, this contamination has been an unprecedented experiment: "We are subjecting whole populations to exposure to chemicals which animal experiments have proved to be extremely poisonous and in many cases cumulative in their effects. These exposures begin at or before birth and - unless we change our methods - will continue through the lifetime of those now living. No one knows what the results will be because we have no previous experience to guide us."

-Vice President Al Gore, January 22, 1996

One of the little advertised features of incinerators is their ability to create new hazardous substances from the waste stream being treated. These new creations are often referred to as products of incomplete combustion (PICs). The Army's incinerators will create and release PICs when PCB-contaminated and other components of the Army's waste stream are incinerated. It is important to note that PICs are not created and/or released by other technologies that were not considered by the EPA or the Army.

EPA Response: Commentor should be aware that none of the alternative technologies considered by the Army has been demonstrated to destroy PCBs. The ACWA project has demonstrated three technologies to destroy chemical agents. None of these technologies has processed the M55 rocket or parts of the rocket. The PCBs are contained in the rocket firing/shipping tubes.

Additionally, the three technologies demonstrated in the ACWA programs use chemical reagents to destroy PCBs and other wastes. During the manufacturing process of these chemical reagents, significant quantites of electrical power are consumed. In the generation of the electrical power, PICs, heavy metals and other harmful chemicals may be discharged. During the manufacturing of the chemical reagents, waste streams containing harmful organic compounds and heavy metals may be discharged with inadequate controls. Use of the chemical reagents to destroy PCBs and other waste may in turn result in vast quantities of waste streams which must be neutralized and treated prior to discharge. Commentor must consider these factors prior to advocating these alternative technologies.

Commentor 7D:

A recent EPA research report on the emissions of hazardous waste incinerators provides the following critical assessment:

It can be concluded from these experiments that the current sampling and analytical schemes for characterizing HWC [hazardous waste combustion] emissions are inadequate and provide an incomplete picture of the emission profile. This is primarily due to the presence of an extremely complex mixture of organic compounds in the HWC emission samples.... the number of compounds suspected to be present in incinerator **emissions may be an order of magnitude greater** than initially suspected.

Development of a Hazardous Waste Incinerator Target Analyte List of Products of Incomplete Combustion; EPA Office of Solid Waste; National Risk Management Research Laboratory, Research Triangle Park (USEPA - 600/R-98-076 July 1998) at 4-1 (emphasis added) ("EPA PIC Study 1998"). The information provided in this EPA report reveals that any assessment of risks caused by emissions from the Army's incinerators is flawed, it also means that the assessment of risks caused by release of chemicals from a the filter units and other facility components has not been properly characterized.

EPA Response: EPA notes that the emissions of compounds from the DFS which make up the PICs all were below the hazardous risk assessment levels. Commentor cites a research project which undertook to characterize emissions from the incineration of hazardous waste. The study focused on potential PIC formation and to determine if these chemical compounds could be detected and quantified. To achieve this goal, EPA researchers operated the combustion device used in this study at **non-optimal conditions**, thereby increasing the potential for greater mass and greater variety of PICs to form. Commentor quotes from the reference which concludes that "current sampling and analytical schemes for characterizing HWC emissions are inadequate..." Commentor fails to indicate that the purpose of this study was to promote the formation of PICs so that a list of analytes be developed "that should be investigated as PICs from hazardous waste incineration." To promote the formation of PICs the following sub-optimal conditions were implemented during the study:

1. Metals, as catalysts, were injected in the feed to "promote any heterogeneous reactions forming PCDDs/PCDFs."

2. Afterburner temperatures ranged from 459°C to 1054°C.

3. The afterburner was shut off for a period of time in two of the tests.

4. The combustion was performed in fuel-rich condition in several tests.

5. The exhaust gas from the test apparatus was passed through a full scale incineration unit equipped with air pollution control equipment prior to releasing to the atmosphere.

All of the items above point to the fact that conditions were designed and implemented to produce a large variety of organic compounds to expand the list of potential PICs from incineration process so that instrumentation and methods to detect and to monitor these potential PICs may be developed and improved.

Commentor 7D:

In general, an evaluation of the literature on PICs indicates that only about fifteen (15) percent of the PICs that will be produced by a hazardous waste incinerator have been identified.[2] Of course, this means that about ninety percent of PICs are unidentified. This enormous data gap poses serious concerns for proper assessment of the human health and environmental risks posed by the operation of the Army's incinerators. This problem of PIC identification, quantification, and toxicity analysis is well known to the agencies and the incinerator industry.

EPA Response: Commentor's reference, i.e., Trenholm, et al, 1986, presents results from a survey of data available in 1986. This technical paper indicates that emission tests performed prior to 1986 concentrated on identifying compounds on the hazardous waste list in the RCRA Appendix VIII table (40 CFR 261 Appendix VIII, Hazardous Constituents). The paper indicates that up to 50% of the total hydrocarbons have been identified. Additionally, Trenholm et al describes the initiation of an EPA project to quantify total mass effluent from a commercial incinerator to provide engineering support for regulatory support. Commentor was stating conditions as they existed in 1986.

Commentor 7D:

In an assessment of incineration, EPA found, "[v]ery few tests have been conducted to identify and quantify PICs from hazardous waste combustors under nonoptimum conditions." [3] Moreover, the relationship between incinerator performance during brief trial burns and that achieved during routine operations has been characterized as follows: "The trial burn data only indicate how well the incinerator was operating during the time that the data were being taken, typically only a period of a few days. No information is obtained on how the incinerator might respond if fuel, or especially waste, conditions change. ... It is difficult to generalize the results of a trial burn to predict how the composition of the incinerator exhaust will change under these varying conditions." [4]

EPA Response: EPA agrees with Commentor's contention that it is, in fact, difficult to generalize trial burn

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2 See, e.g., Trenholm, A.R., C.C. Lee, "Analysis of PIC and Total Mass Emissions from an Incinerator," U.S. EPA and Midwest Research Institute.

3 U.S. Environmental Protection Agency, "Background Document for the Development of PIC Regulations for Hazardous Waste Incinerators, Draft Final Report, Washington, D.C., October 1989.

4 Staley, L., M. Richards, G. Huffman, and D. Chang, "Incinerator Operating Parameters Which Correlate with Performance, " EPA/600/2-86/091, U.S. Environmental Protection Agency, Washington, D.C., October 1986.

results to predict emissions during non-optimal operating conditions or changing fuel and feed conditions. Commentor's References 3 and 4 on this topic present results from EPA studies in support of developing regulations to control emissions during changing operating conditions. Because difficulties exist in pin-pointing the exact compound(s) in stack emissions, EPA confirmed in these studies that surrogate chemical compounds exist in the flue gas suitable for continuous monitoring and appropriately representing PIC emissions. EPA selected carbon monoxide (CO) and total hydrocarbons (THC) as PIC surrogates suitable for continuous monitoring. **Thus incinerator operations may be regulated by placing limits on CO and THC emissions to maintain emission of PICs of concern below significant levels.**

Commentor 7D:

The following observation from a EPA study is applicable to the Army's incinerators: "One present concern for application of incineration technology is that the hazard associated with a waste stream may not be removed even though the original waste compounds are destroyed. Transformation of the waste into hazardous products of incomplete combustion (PICs) can potentially aggravate the hazard associated with the waste stream. For example, a hazardous but nontoxic waste can be partially transformed into chlorinated dibenzo-p-dioxins or dibenzofurans upon incineration." [5] Chlorinated dioxins and furans are formed when carbon and the halogen, chlorine, are present in the waste fed into incinerators and other combustion systems. Polyhalogenated dioxins and furans and other dioxin-like chemicals will undoubtedly be among the products of incomplete combustion released during the incineration of mixed waste, just as they are among the "thousands of different compounds" that are, according to EPA, typically found in the stack emissions of hazardous waste incinerator. [6]

EPA Response: Commentor quotes from the EPA study (Ref. 5, Kramlich et al) which was "directed towards determination of the identity and source of hazardous PIC's observed in the exhaust of the turbulent flame reactor." The turbulent flame reactor was operated under stoichiometric but varying conditions including sub-optimal conditions. The study concludes "conditions that promote high combustion efficiency will favor reduced PIC emission." PCB incineration regulations require operating conditions which ensure high combustion efficiency, i.e., high temperature, residence time, excess oxygen and Combustion Efficiency.

Commentor 7D:

There has been no full identification of the mass of pollutants known to be present in stack gases in any trial burn at any hazardous waste incinerator, nor is this likely to be achieved: "PIC emissions are composed of thousands of different compounds, some of which are in very minute quantities and cannot be detected and quantified without very elaborate and expensive sampling and analytical [S&A] techniques. Such elaborate S&A work is not feasible in trial burns for permitting purposes and can only be done in research tests. Very few research tests have been conducted to date to identify and quantify all the PICs in a typical emissions sample, and whenever done were unsuccessful because sampling and analysis techniques are not

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5 J.C. Kramlich, E.M. Poncelet, R.E. Charles, W.R. Seeker, G.S. Samuelsen, and J.A. Cole, "Experimental Investigation of Critical Fundamental Issues in Hazardous Waste Incineration," EPA/600/2-89/048, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina, September 1989.

6 U.S. Environmental Protection Agency, "Standards for Owners and Operators of Hazardous Waste Incinerators and Burning of Hazardous Wastes in Boilers and Industrial Furnaces; Proposed and Supplemental Proposed Rule, Technical Corrections, and Request for Comments," 55 Fed. Reg. 82, April 27, 1990.

available to identify or quantify many of the potential compounds emitted, nor are toxicity data available for all the compounds." [7]

EPA Response: Commentor does not quote directly from Reference 7 (US EPA 1990). Commentor's last sentence (Very few....) is not part of the text quoted at page 17880 of the reference. Although EPA acknowledges that current sampling and analytical technology do not profile incinerator emissions completely, EPA believes that when operated efficiently, emissions from hazardous waste incinerators do not pose an unreasonable risk to health and the environment. To quote from Reference 7, page 17880, "Estimate of risk to public health resulting from PICs, based on available emissions data, indicate that PIC emissions do not pose significant risks when incinerators are operated under optimum conditions." To ensure PCB incinerators operate under optimum conditions, the PCB regulations require incinerators operate at high temperature, two-second residence time, minimum excess air and 99.9% Combustion Efficiency.

Commentor 7D:

All of the referenced studies point to the same conclusion: The incineration technology proposed by the Army to dispose of PCB-contaminated materials produces unknown emissions that cannot be properly assessed to determine the full extent of potential human health and environmental impacts. Consequently, the EPA may not issue an Approval.

EPA Response: Commentor's premise is correct that emissions from incinerators have not been 100% characterized. However, based on current data we conclude that the operations from the DFS do not pose an unreasonable risk to health and the environment when operated under optimum conditions (Ref.7). The TSCA Approval imposes operating conditions to ensure that whenever the sub-optimal conditions initiates, the PCB feed will automatically be shut down. Moreover, data collected during Trial Burn 2 indicated that PCBs which were detected were just above the detection limit and orders of magnitude below the health risk assessment level. Dioxin and furan emissions were orders of magnitude below the new emission standard of 0.2 ng/m^3. Therefore, EPA believes that the Approval should be granted for operations of the TOCDF DFS.

Commentor 7E: The Creation And/Or Release Of PCBs And Other Dioxin-Like Chemicals Will Cause Harm and Present An Unreasonable Risk Of Injury To Human Health And The Environment.

There are documented worldwide increases in the number of diseases or conditions of the reproductive system in infants, children, and adults that may be linked to early exposures to hormonally active chemicals . . . the world's populations of humans and wildlife participate in the ongoing experiment.

- From "Generations at Risk: Reproductive Health and the Environment"[8]

As mentioned previously, the Army's chemical warfare agent incinerators and related components will create and/or release dangerous contaminates such as: PCBs, dioxins, furans, metals, and a host of other known and unknown substances. As it is the focus of EPA's nationwide approval effort, we will first discuss PCBs.

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7 Id. (EPA 1990).

8 Schettler, Solomon, Valenti, and Huddle, "Generations at Risk: Reproductive Health and the Environment," MIT Press 1999, pp. 168-169.

Impacts Of PCBs Will Cause Harm.

Like its cousins from the dioxin family, PCBs are a very dangerous class of chemicals that are presently spread throughout the world, including the bodies of most humans. The analysis of the dangers associated with PCB emissions is similar to that of dioxins. Simply stated, people in the United States are already overexposed to PCBs. The following passage makes the point.

> It appears that despite a twenty-year ban on U.S. production, **PCB exposures at current ambient environmental levels impair intellectual and motor development of children.** The environmental persistence of these chemicals and their tendency to bioaccumulate ensure continued exposure for years to come.[9]

This statement is consistent with the views of many distinguished scientists who met in Erice, Sicily in November 1995 regarding environmental endocrine disrupting chemicals. The consensus statement of those scientists, in part, is reflected here.

> The full range of substances interfering with natural endocrine modulation of neural and behavioral development cannot be entirely defined at present. However, **compounds shown to have endocrine effects include dioxins, PCBs, phenolics, phthalates, and many pesticides.** Any compounds mimicking or antagonizing actions of, or altering levels of, neurotransmitters, hormones, and growth factors in the developing brain are potentially in this group.
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> Because certain **PCBs and dioxins are known to impair normal thyroid function, we suspect that they contribute to learning disabilities, including attention deficit hyperactivity disorder and perhaps other neurological abnormalities.** In addition, many pesticides affect thyroid function and, therefore, may have similar consequences.

Statement from the work session on environmental endocrine disrupting chemicals: Neural, endocrine and behavioral effects, Erice, Sicily, November 1995 (emphasis in original).[10]

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9 "Generations at Risk," p.179 (emphasis added). See the review of the scientific evidence supporting the quoted statement at pp. 175 - 179.

10 The authors of the Erice Statement are: Dr. Enrico Alleva, Head Section of Behavioral Pathophysiology Institute of Neurobiology, Rome, Italy; Dr. John Brock, Chief, PCBs and Pesticides Laboratory National Center for Environmental Health Centers for Disease Control Atlanta, GA; Dr. Abraham Brouwer Associate Professor and Toxicology and Research Coordinator Department of Toxicology Agricultural University Wageningen, The Netherlands; Dr. Theo Colborn, Senior Program Scientist Wildlife and Contaminants Project World Wildlife Fund Washington, DC; Dr. M. Cristina Fossi, Professor Department of Environmental Biology University of Siena, Siena, Italy; Dr. Earl Gray Section Chief Developmental and Reproductive Toxicology Section US EPA Research Triangle Park, NC; Dr. Louis Guillette, Professor Department of Zoology University of Florida Gainesville, FL; Peter Hauser, MD, Chief of Psychiatry Service (116A) Baltimore VAMC 10 North Greene Street Baltimore, MD; Dr. John Leatherland, Professor, Chair Department of Biomedical Sciences Ontario Veterinary College University of Guelph Ontario, Canada; Dr. Neil MacLusky, Professor Director Basic Research Div of Reproductive Science Toronto Hospital Ontario, Canada; Dr. Antonio Mutti, Professor Laboratory of Industrial Toxicology University of Parma Medical School, Parma, Italy; Dr. Paola Palanza, Researcher Department of Biology and Physiology University of Parma, Parma, Italy; Dr. Susan Porterfield Associate Professor and Associate Dean of Curriculum Medical College of Georgia, Augusta, GA; Dr. Risto Santti, Associate Professor Department of Anatomy Institute of Biomedicine University of Turku Turku, Finland; Dr. Stuart A. Stein, Associate Professor or Neurology, Medicine, Pediatrics, OB-GYN, and Molecular and Cellular Pharmacology University of Miami School of Medicine, Miami, FL and Chief of Neurology

EPA Response: The previous texts are excerpts from a document available at the electronic address: www.ourstolenfuture.org/Consensus/erice.htm. This internet site addresses the topic of persistent pollutants and it effects on human health and is the web site for the book "Our Stolen Future," i.e., commentor's Reference 19. This discussion reinforces the need for effective destruction of PCBs. To date, only thermal treatment which includes incineration has demonstrated effective disposal and destruction of PCBs. Currently, there exists an absence of effective alternate technology to destroy PCBs, as discussed in previous responses.

Commentor 7E:

We cannot afford to add additional PCBs to our already overexposed bodies and environment. As the literature cited points out, we may already be at or above the danger point. The incineration technologies proposed by the Army's create and release many known and unknown dangerous substances. No set of approval conditions that could be crafted can erase the dangerous flaws in the proposed technologies. Therefore, the EPA, by law, must reject the Army's plan to incinerate PCBs.

In fact, incineration is probably the worst technology from a public health and environmental perspective. See, Pat Costner, D. Luscombe, M. Simpson, "Technical Criteria for the Destruction of Stockpiled Persistent Organic Pollutants," Greenpeace, October 7, 1998. This report eloquently discusses the weaknesses of incineration and describes other technologies that may be more suitable for dealing with persistent organic chemicals (e.g., PCBs).

EPA Response: Commentor's reference, i.e., Coster, et al, cites current management practices for persistent organic pollutants (e.g., PCBs) which include "storage, burial in landfills, and/or burning in combustion systems...also...injection in deep wells." Of these management practices, Coster, et al, state "...only combustion systems accomplish some degree of destruction." Coster, et al, outline performances for nine modern destruction technologies. Of the nine, only one technology has been approved by EPA to dispose of PCBs, i.e., catalytic hydrogenation used to destroy PCBs in waste oil. The remaining eight technologies have not demonstrated destruction of PCBs to TSCA standards. Thus far, only catalytic hydrogenation has been commercialized, but only to treat fluids and not solid material such as rocket tubes. Of all the technologies addressed by Coster, et al, only incineration meets the standards for disposal of PCBs in solid matrices such as rocket tubes.

Commentor 7E:

As documented above, PCBs are of great concern to human health because they are resistant to breakdown in the environment and concentrate in the fatty tissues of animals and people. Recently, the U.S. Public Health Service, The Agency for Toxic Substances and Disease Registry noted:

"Recent findings indicate that susceptible populations (e.g., certain ethnic groups, sport anglers, the elderly, pregnant women, children, fetuses, and nursing infants) continue to be exposed to PCBs via fish and wildlife consumption. Human health studies discussed in this summary indicate that: 1) reproductive function may be disrupted by exposure to PCBs; 2) neurobehavioral and developmental deficits occur in newborns and continue through school-aged children who had in utero exposure to PCBs; 3) other systemic effects (e.g., self-reported liver disease and diabetes, and effects on the thyroid and immune systems) are associated with

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elevated serum levels of PCBs; and 4) increased cancer risks, e.g., non-Hodgkin's lymphoma, are associated with PCB exposures."[11]

In fact, separate studies on U.S., Dutch, Japanese, and Taiwanese populations link fetal and infant exposure to PCBs with a wide range of neurological and developmental problems, including lower IQ, poor short term memory, slower reflexes, poor reading comprehension, low birth weight, and poor cognitive functioning.[12] When alternatives to incineration are clearly available there is no reason to subject humans or the environment to the dangers of **PCBs**.

PCBs can "bio-magnify," increasing in concentration at each higher level of the food chain. Food chain exposures to PCBs can exceed inhalation exposure by 10 to 3000 times, depending on food consumption patterns.[13] The EPA is also well aware of the fact that PCBs often travel long distances to impact communities and water bodies that are some distance away from the source of the PCBs. The issue of long and medium range transport of PCBs and other persistent compounds is most evident in EPA's work involving the Great Lakes. See, e.g., Great Lakes Mass Balance Study. Spreading the risk of PCB dispersion through poorly designed incineration fails to protect human health or the environment from unreasonable risk as

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11 "Public Health Implications Of Exposure To Polychlorinated Biphenyls (PCBs)," U.S. Public Health Service, The Agency for Toxic Substances and Disease Registry, U.S. Department of Health and Human Services, and The U.S. Environmental Protection Agency (Revised February 2, 1999).

12 Longnecker, MP, WJ Rogan and G Lucier, "The human health effects of DDT (dichlorodiphenyltrichloroethane) and PCBs (polychlorinated biphenyls) and an overview of organochlorines in public health," Annual Review of Public Health, 18:211-244, 1997.
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Rogan, WJ, BC Gladen, JD McKinney, N Carreras, P Hardy, et al,"Neonatal effects of transplacental exposure to PCBs and DDE," Journal of Pediatrics, 109: 335-341, 1986.

13 D. Cleverly, U.S. EPA, G. Rice, U.S. EPA, S. Durkee, U.S. EPA,F. Bradforn, ORNL, C. Travis, ORNL, "Estimating Total Human Exposure to Toxic Air Pollutants Emitted from the Stack of Municipal Waste Combustors," paper presented at the 1993 International Municipal Waste Combustion Conference, Williamsburg, VA, March 30,-April 2 (Sponsored by the Air and Waste Management Association and the U.S. Environmental Protection Agency.)

mandated by TSCA.

What is most disturbing about EPA's plan to provide the Army with nationwide approval for the incineration of PCB-contaminated wastes is that the Agency callously disregards current human health and environmental issues that clearly warrant a ban on emissions of PCBs, dioxins, and other dangerous substances. Examples of current PCB impacts are apparent in the communities in and around Anniston, Alabama.[14] Anniston is one of the communities slated to receive an incinerator to dispose of the stockpile of chemical warfare agents stored there.

EPA Response: Numerous reports are available in open literature discussing the effects of PCBs on human health. The draft document of the dioxin risk reassessment, soon to be published, addresses these human health concerns. In Anniston, the presence of PCB contamination remains from past industrial practices. Programs are in place to remediate these sites containing PCB and other contaminants. The current problem of disposal of chemical agent and chemical agent weapons is equally urgent because these weapons are aging and are leaking and pose a definite risk to human health and the environment. Test results from the Tooele DFS trial burn show that the chemical agents as well as PCBs were destroyed to levels which pose no unreasonable risk to health and the environment.

Commentor 7E:

The Agency for Toxic Substances and Disease Registry (ATSDR) has found that "[e]xposures to PCBs in soil in parts of Anniston present a public health hazard."[15] ATSDR further found that "young children [in Anniston] have elevated levels of PCBs."[16] EPA has failed to consider the current human health and environmental conditions in and around Anniston, Tooele, Umatilla, and Pine Bluff before deciding to allow the Army to incinerate PCB-contaminated materials. This is a gross abdication of EPA's responsibility to protect human health and the environment.[17]

EPA Response: A risk assessment for each facility will be in place prior to the start of operation at each location. At Tooele, the health risk assessment included a PCB emission rate which would protect human health and the environment. The trial burns at Tooele confirmed that PCB emission rates from the DFS posed no unreasonable risk to health and the environment. The emission rates from Trial Burn 2 indicated that the PCB emission rates were orders of magnitude lower than the health risk assessment value. Tests will be performed and results reviewed at Anniston, Pine Bluff and Umatilla prior to initiation of disposal operations.

To address the current sites contaminated with PCBs and other chemicals, EPA has in place remediation

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14 Some of the story behind the PCB contamination in Anniston is well told in a recent published article. See, *What Monsanto Knew: Outraged by PCB Contamination, an Alabama Town Unearths a Company's Past*, by Nancy Beiles, *The Nation*, May 2000 (attached).

15 Evaluation of Soil, Blood & Air Data From Anniston, Alabama Calhoun County, Alabama, ATSDR Health Consultation, Executive Summary.

16 Id.

17 EPA's failure to consider the impacts on the children of Anniston and those in and around the other impacted areas violates the President's directive on protecting the health of children from environmental contaminates. See, Executive Order 13045.

projects to clean up these sites. Because of existing contamination in the area, it is doubly important to destroy the chemical agents and chemical weapons, including the PCBs in the rockets, to preclude further contamination from potential release of chemicals from the facility.

Commentor 7E:

Moreover, EPA has failed to consider the Environmental Justice consequences of allowing the Army to incinerate PCB-contaminated materials in its chemical warfare agent incinerators. Communities that are politically disenfranchised or that have been historically subject to discrimination live in and around the areas where the Army plans to incinerate PCB-contaminated material and other components of the chemical warfare agent stockpile. The failure of the EPA to fully assess the consequences of the planned PCB incineration Approval on these communities violates their civil rights and principles of Environmental Justice. See, e.g., Executive Order 12898. The further failure to consider less harmful alternatives to incineration is a violation of NEPA and the Executive Order.[18]

EPA Response: EPA is firmly committed to incorporating the principles of environmental justice into its decision-making processes. As directed by Executive Order 12898, EPA makes every effort to conduct its programs, policies, and activities that substantially affect human health and the environment in a manner that ensures the fair treatment of all people, including minority populations and/or low-income populations. An initial review of census data for the areas surrounding the Army's M55 chemical agent rocket stockpiles at Tooele, Utah, Anniston, Alabama, Pine Bluff, Arkansas, and Hermiston, Oregon, indicates that some of these communities could be minority or low-income communities. However, EPA believes that a complete environmental justice analysis is unnecessary, because EPA has determined that the best solution to minimize potential risks to the surrounding communities from the chemical weapons stockpiles located near them is on-site destruction in a DFS

These weapons are aging. They have been in storage for decades. There is a history of detection of chemical agents from rockets and other weapons while in storage. Chemical agent releases will not only affect the operators and personnel in the immediate area of the rockets and weapons but also residents and the general public in surrounding areas. Transportation of the rockets to another site would require moving these rockets through the surrounding neighborhoods and pose additional unnecessary risks. Finally, as already discussed, alternative destruction technologies are not a practical option. Therefore, EPA believes that it has adequately considered the impacts on all of the communities surrounding these rocket stockpiles.

Commentor 7 footnote 18

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18 Implementation of non-incineration technologies for destruction of chemical weapons, including those containing PCBs, could greatly reduce the risk of exposure to PCBs throughout the demilitarization process. Some technologies - including some of the technologies being demonstrated through the Assembled Chemical Weapons Assessment (ACWA) program - have proven capability of treating PCBs to EPA's required DRE **and have achieved overall greater destruction efficiency of PCBs than that of incineration.** The very nature of the ACWA review criteria and demonstration results, establishes that these technologies are also much more likely to be accepted by the public than is incineration. The Army and EPA would be well served to seek destruction technologies which accomplish greater protection of public health and the environment from PCBs, dioxins and other persistent chemicals which would otherwise be released through an incinerator smokestack.

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EPA Response: Commentor's claim that PCBs have been treated using technologies being developed through the ACWA program is erroneous. Progress on alternative technologies includes treatment of the chemical agent only. Authorization has been received to proceed with pilot studies in Maryland and Indiana to dispose of mustard agent and VX (web site - http://www-pmcd.apgea.army.mil/m_body.asp). Treatment of weapons containing agent has been demonstrated only on small scale units. None of the technologies have treated M55 rockets or its components. The firing/shipping tubes in the M55 rockets contain PCBs. Hence, the technologies being developed under the ACWA Program has failed to treat any PCBs.

EPA welcomes the effort put forth by the Army through the ACWA Program to develop alternate technologies to destroy PCBs. For over a decade, EPA has evaluated numerous technologies, including chemical dechlorination, plasma arc furnaces, gaseous phase hydrogenation, and solvated electron. EPA approved chemical dechlorination processes, thermal desorption units, soil washing process using solvent extraction, and catalytic hydrogenation. EPA observed some success with solvated electron technology.

Commentor 7E: The Impacts From Dioxin Emissions Will Cause Harm.

Although EPA's planned approval only focuses on PCBs, the Agency is well aware that the incineration of PCB-contaminated materials will also create other dangerous emissions. One dangerous chemical that is often analyzed together with PCBs because of similarities in persistence and health and environmental impact is dioxin.

> In general, the family of chemicals referred to as dioxin has been described as follows:
> In the world of synthetic chemicals, dioxin has enjoyed the reputation of being the worst of the troublemakers--the most deadly, the most feared, and the most elusive to scientists seeking to unravel the secrets of its toxicity. Lab tests had shown dioxin to be thousands of times more deadly than arsenic to guinea pigs, who died after swallowing only one-millionth of a gram per kilogram of body weight, and the most potent carcinogen ever tested in a number of animal species.
>
> . . . the chemical known to scientists as 2,3,7,8-TCDD [one form of dioxin] and to the public as the "most toxic chemical on earth"-is for the most part an inadvertent by-product of twentieth-century life, a contaminant created during the manufacture of certain chlorine-containing chemicals such as pesticides and wood preservatives . . . incinerating trash . . . and burning fossil fuels. Like DDT and PCBs, dioxin is a fat-loving persistent compound that accumulates in the body. And like other persistent chemicals it has been detected virtually everywhere-in air, water, soil, sediment, and food.
>
> Although discussion usually focuses on 2,3,7,8-TCDD, it is important to remember this is only the most toxic and notorious member of the dioxin family, which contains 74 other problematic chemicals. Moreover, dioxin is found more often than not in the company of furans-a related family of contaminants containing 135 chemicals with a structure similar to dioxins and with similar toxic and biological effects

on animals.[19]

Actually, the dioxin family is likely even larger than described in the passage quoted when one considers brominated, bromochloro, and sulfur analogs of dioxins and furans.[20]

In an effort to understand and assess the potential impacts of dioxin and related compounds, EPA has been involved in an evaluation of these dangerous chemicals. EPA has provided, in part, the following assessment:

> . . . **[data suggests] dioxin results in a broad spectrum of biochemical and biological effects in animals and, based on limited data, some of these effects occur in humans. Relatively speaking, these exposures and effects are observable at very low levels in the laboratory and in the environment when compared with other environmental toxicants.** [emphasis in original] (EPA's Dioxin Health Assessment, Draft, Aug. 1994) at 9-74.
>
> These compounds . . . are extremely potent in producing a variety of effects in experimental animals based on traditional toxicology studies at levels hundreds or thousands of times lower than most synthetic chemicals of environmental interest. In addition, human studies demonstrate that exposure to dioxin and related compounds is associated with subtle biochemical and biological changes whose clinical is as yet unknown . . . Id. at 9-74 to 9-75.
>
> **A large variety of sources of dioxin have been identified and others may exist. Because dioxin-like chemicals are persistent and accumulate in biological tissues, particularly in animals, the major route of human exposure is through ingestion of foods containing minute quantities of dioxin-like compounds. Certain segments of the population may be exposed to additional increments of exposure by being in proximity to point sources or because of dietary practices.** [Emphasis in original] Id. at 9-75.
>
> **There is adequate evidence based upon all available information, including studies in human populations as well as in laboratory animals and from ancillary experimental data, to support the inference that humans are likely to respond to a broad spectrum of effects from exposure to dioxin and related compounds, if exposures are high enough. These effects will likely range from adaptive changes at or near background levels of exposure to adverse effects with increasing severity as exposure increases above background levels.** [Emphasis in original] Id. at 9-79.
>
> **In TCDD-exposed men, subtle changes in biochemistry and physiology, such as enzyme induction, altered levels of circulating reproductive hormones, or reduced glucose tolerance, have been detected in a limited number of available studies. These findings, coupled with knowledge derived from animal experiments, suggest the potential for adverse impacts on human metabolism and developmental and/or reproductive biology and, perhaps, other effects in the range of current human exposures . . . As body burdens increase within and above [average background intake], the probability and severity as well as the spectrum of human noncancer effects most likely increase . . . the margin of exposure (MOE) between background levels and levels where effects are detectable in humans in terms of TEQs is considerably smaller than previously estimated.** [Emphasis in original]. Id. at 9-81.
>
> **With regard to carcinogenicity, a weight-of-evidence evaluation suggests that dioxin and related compounds (CDDs, CDFs, and dioxin-like PCBs) are likely to present a cancer hazard to humans.** [Emphasis in original]. Id. at 9-85.

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19 "Our Stolen Future," p. 113.

20 EPA PIC Study 1998 at 1-1 (complete citation in text).

Concerning the carcinogenicity of dioxin-like compounds, the International Agency for Research on Cancer (IARC) which is part of the World Health Organization (WHO) has formally defined the most potent member of the dioxin family as being carcinogenic to humans. See, 1997 Abstract of IARC Monograph. Among other things, the IARC stated that "[b]ecause of the long half lives of many [dioxin-like] substances in humans (e.g., ca. 7 years for TCDD), a single, acute exposure from the environment results in the exposure of the potential target tissues for a period of years." Id. at 1.

Physicians and scientists who have reviewed EPA's work on the assessment of dioxin as well as other data concerning the current impacts of dioxins provide similar warnings.

The extensive six-year EPA review documents a wide range of health effects that result from exposure to dioxin, some of which occur at extremely low exposure levels, and provides important information about dioxin sources. Although there is some variation with geographical location and diet, **many people have dioxin levels at or near those known to cause harmful effects in animal studies.**[21]

Investigators in the Netherlands found that higher dioxin levels in breast milk correlate with lower thyroid hormone levels in breast-feeding infants.[22] **This finding is particularly important since the correlation appears at current levels of ambient dioxin exposure.** Moreover, in pre-term and low-birth-weight babies, decreased thyroid hormone in the first weeks of life is associated with increased risk or neurological disorders, including the need for special education by age nine.[23]

Once dioxin occupies the receptor in a human cell, researchers have found it binds to DNA in the cell nucleus, prompting many of the same changes in gene expression seen in animal experiments. Humans seem no less sensitive to this effect. But what happens afterwards to produce all of dioxin's disparate biological effects, including developmental disruption, remains a mystery. However it happens, **dioxin acts like a powerful and persistent hormone that is capable of producing lasting effects at very low doses--doses similar to levels found in the human population.**[24]

. . . no matter which agency's calculations are used to establish safe daily intake levels of dioxins, the average daily intake of the average person, approximately 120 pg, exceeds or equals them all. The average daily intake of Americans, which is about 2 pg/kg bw (Schecter, 1999) is more than 200 times higher than the EPA dose, twice the ATSDR MRL, and in the middle of the WHO TDI range. If dioxin-like PCBs are included, then the daily intake of dioxin is that much higher than these standard guidelines . . . the average daily intake of dioxin in the U.S. is well above these federal and international guidelines.[25]

. . . dioxin harms people at body burden levels ranging from 14 to 83 ng/kg, levels comparable to those

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21 "Generations at Risk," p. 170 (emphasis added), citing, Birnbaum LS. The mechanism of dioxin toxicity: relationship to risk assessment. Environ Health Perspect 102(Suppl 9): 157-167, 1994.

22 "Generations at Risk," p. 175, citing, Koopman-Esseboom C, Morse D, Weisglas-Kuperus N, et al. Effects of dioxins and polychlorinated biphenyls on thyroid hormone status of pregnant women and their infants. Pediatr Res 36:468-473, 1994.

23 "Generations at Risk," p. 175 (emphasis added), citing, den Oden AL, Verkerk PH, et al. The relation between neonatal thyroxine levels and neurodevelopmental outcome at age 5 and 9 years in a national cohort of very preterm and/or very low birth weight infants. Pediatr Res 39:142-145, 1996.

24 "Our Stolen Future," p. 120 (emphasis added).

25 Center for Health, Environment and Justice, "American People's Dioxin Report: Technical Support Document," Falls Church, VA, November 1999, at 33.

> that harm other animals. If depression of the immune system occurs at 7 ng/kg . . . and Americans have an average dioxin body burden of 10 ng/kg, then the immune system of some Americans may be compromised, and any general increase in dioxin exposure may be even more harmful to the general population. Whether one uses daily intake rates or body burdens, the levels of dioxin that Americans have been exposed to are harmful or just short of being near harmful. Dioxin is an ubiquitous toxin that reaches people in a most fundamental way: through our food. Whether that food comes from supermarket shelves, fish in a river, or breast milk, it contains measurable and often harmful amounts of dioxin.[26]

As the work done by EPA and the analyses provided by independent physicians and scientists makes clear, we already have enough dioxin in our bodies to cause a variety of health effects. Adding more dioxin to the environment through incineration of the Army's PCB-contaminated materials will surely cause harm or increase the harm already being experienced.

EPA's concerns about dioxin and related compounds are shared by the Agency for Toxic Substances and Disease Registry (ATSDR). See, ATSDR Toxicological Profile for Chlorinated Dibenzo-p-Dioxins, December 1998. ATSDR outlines a number of important concerns regarding dioxin:

> [B]ecause of the magnitude of uncertainty in dose response relationships for 2,3,7,8-TCDD, the possibility that current background exposures may be sufficient to contribute to a risk of adverse health effects in human populations cannot be completely excluded. [Id. at 266].
>
> Children appear to be unusually susceptible to the dermal toxicity of 2,3,7,8-TCDD . . . Additionally, the available animal data suggests that the developing fetus is very sensitive to 2,3,7,8-TCDD-induced toxicity. 2,3,7,8-TCDD appears to interfere with the development of the reproductive, immune, and nervous systems; the mechanisms of action for these toxic effects have not been elucidated. [Id. at 317].

ATSDR also noted that children face additional risks of exposures to 2,3,7,8-TCDD through dietary habits if they are: breast-fed; children of local fishers who consume larger amounts of local fish than the general population; children of subsistence hunters; or children of subsistence farmers. Id. at 477 - 478. In general populations that face potentially high exposures to 2,3,7,8-TCDD include: persons exposed through environmental contamination; persons living near waste disposal facilities; recreational and subsistence fishers; subsistence hunters; and subsistence farmers. Id. at 485 - 497. Unfortunately, it is clear that the Army's incinerators will create dioxin and dioxin-like compounds and cause them to be released into the environment. It is equally clear on the present record that EPA has failed to analyze the combined impacts of the PCBs, dioxins, and other hazardous compounds that will be released by the Army's incinerators.

In sum, because the Army incinerators will release PCBs, dioxins, and other hazardous chemicals, and harmful effects may already be occurring as a result of current exposures to these compounds, there are no Approval conditions that can adequately protect human health and the environment. Consequently, EPA must deny the Army's request for nationwide approval to incinerate PCB-contaminated materials.

EPA Response: EPA has participated in the evaluation of the Army's DFS operations during trial burns at both Johnston Atoll and Tooele, Utah. Although the DFS at Johnston Atoll is slightly smaller in scale, the DFS unit at Tooele is a duplicate of the DFS units at Anniston, AL; Umatilla Co., OR; and Pine Bluff, AR. Therefore, EPA expects that performance test results from the Tooele unit to be similar if not identical to those at Anniston, Umatilla and Pine Bluff. Test results from Tooele indicated that the PCB incinerator

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26 Id. at 36.

standard of 99.9999% destruction and removal efficiency were surpassed, the PCB emission rate was orders of magnitude lower than the health risk assessment (HRA) value, the dioxin TEQ emission rate was also orders of magnitude below the HRA value, and that emissions of other hazardous material met HRA values. Therefore, EPA has determined that the performance of the DFS units do not pose unreasonable risk to health and the environment and that a nationwide approval should be granted.

Commentors 7 Conclusion

EPA's plan to allow the Army to incinerate PCB-contaminated materials in Anniston, Pine Bluff, Tooele, and Umatilla violates NEPA, TSCA, the civil rights of the directly impacted populations, principles of Environmental Justice, and the rights of children. EPA has failed to properly notice the public and provide accessible information regarding its intentions to provide authorization for the Army to incinerate PCB-contaminated wastes. In addition, members of the public who will be injured by the release of PCBs and other dangerous substances have not been afforded an evidentiary hearing.

These serious deficiencies require EPA to deny the Army's request for nationwide approval to incinerate PCB-contaminated wastes. In addition, any temporary approvals for PCB incineration that may have been provided to the Army for operations in Tooele or on Kalama Island must be immediately withdrawn. Alternatively, the Draft Approval must be withdrawn, revised, and reissued for public comments and the proper evidentiary hearings once the noted deficiencies have been corrected.

EPA Response: EPA has determined that the DFS units do not pose an unreasonable risk to health and the environment. At each of the remaining impacted communities, public participation will be scheduled and all comments received will be fully considered and evaluated as part of EPA's determination whether or not to grant the facility operational status. Furthermore, requirements of NEPA have not been circumvented. Elements of Environmental Justice have been examined and EPA has concluded that the most effective way to mitigate potential risks from aging chemical weapons stockpiles to communities surrounding the relevant sites is on-site incineration in a DFS. Therefore, EPA believes that treatment of the chemical agent M55 rocket, subject to provisions of RCRA and TSCA, does not pose unreasonable risk to health and the environment and that the nationwide approval should be issued.